

Risk-taking in software companies: a sector study in Rio Grande do Sul

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RESUMO

A assunção de riscos em empresas de *software*: um estudo do setor no Rio Grande do Sul

Neste artigo, aborda-se a assunção de riscos como uma das dimensões da orientação empreendedora (OE) de uma organização. Tem-se por objetivo consolidar um conjunto de elementos que caracterizam a assunção de riscos em empresas de *software*, a partir da literatura e da prática organizacional. Na revisão teórica, faz-se uma retomada conceitual sobre OE e assunção de riscos, aqui conceituada como a tendência da organização de engajar-se em projetos de risco e a preferência dos gestores por agir com ousadia para atingir os objetivos organizacionais. O método de pesquisa utilizado é de caráter exploratório e qualitativo, com coleta de dados por meio de entrevistas em profundidade, realizadas com dirigentes de 13 organizações de *software* do estado do Rio Grande do Sul que se destacam como empreendedoras. Os resultados do estudo demonstram que as empresas se caracterizam por um comportamento de assumir riscos, muito embora ele repercuta de forma variada. O risco geral é evidente devido à dinamicidade do setor, com constantes mudanças tecnológicas. O risco em negócios destaca-se como o mais evidenciado, em função da concorrência com grandes empresas e multinacionais. O risco na decisão tende a um equilíbrio, com decisões mais arrojadas e outras mais conservadoras. O risco financeiro é manifestado com certa aversão. Conclui-se com a consolidação de um conjunto de elementos que caracterizam a assunção de riscos nas organizações pesquisadas, em que se destaca o risco calculado como novo elemento.

Palavras-chave: assunção de riscos, orientação empreendedora, empresas de *software*.

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1. INTRODUCTION

Risk-taking is an important concept in the field of entrepreneurship, as it reflects the degree of risk involved in resource allocation decisions and in the choice of products and markets, reflecting a certain criterion for decision-making at the organizational level (VENKATRAMAN, 1989). According to Miller (1983), risk-taking is the inclination of the organization to engage in risky projects and the preference of its management for daring actions in order to achieve the organizational objectives.

In a broader context, risk-taking is one of the dimensions of an entrepreneurial orientation (EO). Based on the application of the concept of entrepreneurship to the organization, EO emerges. It refers to the entrepreneurial process and to entrepreneurship at the organizational level. Originally, the concept of EO arose out of the literature on strategic management. As a result, there has been a tendency to use studies from this literature to observe entrepreneurship at the organizational level, in particular in the studies of Miller and Friesen (1982), Miller (1983), and Covin and Slevin (1989; 1991).

Lumpkin and Dess (1996), in an important study on the development of the EO construct, characterized it as consisting of five dimensions of the organizational context: innovativeness, risk-taking, proactiveness, autonomy and competitive aggressiveness. Based on this approach, this article focuses on risk-taking, considered one of the most typical dimensions in the development of entrepreneurial practices (MELLO and LEÃO, 2005).

What motivated this research study was the following question: which elements characterize risk-taking in software organizations? To answer this, the concept of risk-taking from the point of view of an entrepreneurial orientation was used. The focus of this study is the software sector in the state of Rio Grande do Sul (Brazil). Companies renowned for their entrepreneurial spirit in the sector were researched. The choice was based on the fact that software companies have characteristics that denote entrepreneurship, such as focusing on research and development and being a permanent source of product innovation and differentiation, among others.

This article presents the results of an exploratory, qualitative study that aimed to consolidate a set of elements that characterize risk-taking in software firms, based on the literature and on organizational practice. Thus, a brief conceptual review of EO and of risk-taking is presented in section 2. The research method used in this study is described in section 3. A brief contextualization of the software sector and the characterization of the companies that took part in this study are provided in section 4. The results are covered in section 5, describing how risk-taking occurs in the organizations studied. Section 6 presents the final thoughts, consolidating a set of elements on risk-taking capable of providing guidance for this dimension of EO in organizations.

2. ENTREPRENEURIAL ORIENTATION (EO) WITHIN ORGANIZATIONS

One can define EO as the entrepreneurial process, i.e., entrepreneurship at the organizational level.

According to Lumpkin and Dess (1996), the EO of an organization consists of the methods, practices and style of managerial decision-making used to act entrepreneurially. EO and entrepreneurial management are analogous concepts, used to characterize an entrepreneurial organization, an organization with an entrepreneurial posture (COVIN and SLEVIN, 1991).

The concept of EO came from the strategy area and emerged from a strategic choice perspective, which states that the opportunities for new business can be undertaken successfully in a deliberate manner. EO studies indicate that its intensification can have a positive impact on organizational performance and can benefit the organization, highlighting: the fact that EO is positively associated with growth; having a positive impact on the measures of financial performance; providing the organization with the capacity to discover new opportunities; facilitating differentiation and creating a competitive advantage, among others (MILLER, 1983; COVIN and SLEVIN, 1991; ZAHRA, 1993; ZAHRA and COVIN, 1995; WIKLUND and SHEPHERD, 2005; COVIN, GREEN and SLEVIN, 2006). Empirical evidence in Brazilian firms corroborate the relation between EO and good organizational performance, as shown in the studies of Mello *et al.* (2004) and of Fernandes and Santos (2008).

According to Miller (1983), an entrepreneurial organization focuses on innovating, on taking risks and on being proactive, whereas a non-entrepreneurial organization innovates very little, strongly avoids risks and is not proactive in relation to its competitors, merely imitating the changes that occur in the market in which it competes.

Thus, he proposed three dimensions to characterize EO: innovativeness, risk-taking and proactiveness. This characterization, which was developed using the work of Schumpeter (1982) as its basis, is also consistent with more recent studies, such as those of Guth and Ginsberg (1990), besides having influenced several other research studies on entrepreneurial organizations.

Based on Miller's studies, two new dimensions were proposed by Lumpkin and Dess (1996): autonomy and competitive aggressiveness. Together with the three dimensions above, they make up the five dimensions that characterize EO. For these authors, EO consists of the presence of these dimensions in the decision-making style and practices of people in an organization (DESS and LUMPKIN, 2005). Table 1 presents a brief definition of EO dimensions.

Though the five dimensions are considered important for the entrepreneurial process, Lumpkin and Dess (1996) and Kreiser, Marino and Weaver (2002) recall that successful business may be experienced only by a few, which can lead

Table 1

Dimensions of an Entrepreneurial Orientation and Their Definitions

EO Dimension	Definition
Innovativeness	The will to innovate, introducing novelties through creativity and experimentation focused on the development of new products, services and processes.
Risk-taking	Organizational inclination to undertake risky projects and management preference for acting boldly in order to achieve the organizational objectives.
Proactiveness	The search for opportunities, progress through the introduction of new products and the forecast of future needs in order to create change and shape the environment.
Autonomy	Independent action of an individual or team in order to develop a business concept or vision up to its conclusion; actions taken with no organizational pressure.
Competitive aggressiveness	Strong organizational effort to outdo rivals, characterized by a combative posture or aggressive response, with a view to improving the company's position or to overcoming a threat in a competitive market.

Source: Adapted from Miller (1983), and Dess and Lumpkin (2005).

to different combinations of the dimensions. According to the authors, the extent to which each of the five dimensions is useful to predict the nature and the success of an enterprise can depend on external factors, such as the business environment, or on internal factors, such as the organizational structure, or, furthermore, on the characteristics of the organization's founders or leaders.

Thus, the literature indicates that entrepreneurship in organizations is entirely associated with the variables of the environment, structure, strategy and personality of the leader, and that this relationship varies systematically and logically between different organizations (MILLER, 1983; COVIN and SLEVIN, 1991; LUMPKIN and DESS, 1996). Wiklund (1998) states that an entrepreneurial behavior at the level of the individual can affect organizational action and have an impact on the organization's entrepreneurship. Covin and Slevin (1991) also indicate that an entrepreneurial behavior model allows management intervention upon the entrepreneurial process to be clarified and better understood.

Thus, an approach based on the underlying elements of entrepreneurship, in the case the dimensions of EO, enables one to better understand entrepreneurship at the organizational level. It can also provide one with clues on the development of this behavior (COVIN and SLEVIN, 1991). This article focuses on risk-taking, one of the EO dimensions, and on the elements that characterize it, which are discussed below.

2.1. Risk-taking in the context of an entrepreneurial orientation

In this study, risk-taking is seen as the tendency of an organization to engage in risky projects and the preference of its managers for taking bold action in order to achieve the organizational objectives (MILLER, 1983). It captures the degree

of risk reflected in the various resource allocation decisions and in the choice of products and markets, thereby reflecting, in a way, a criterion and a pattern of decision-making at the organizational level (VENKATRAMAN, 1989).

According to Lumpkin and Dess (1996), organizations with EO are normally characterized by risk-taking behavior. The authors indicate three types of risk that an organization and its executives normally face (DESS and LUMPKIN, 2005): business risk, which involves venturing into the unknown without being aware of the probability of success, such as entering untested markets; financial risk, which requires that an organization take a large volume of resources in order to try to obtain high returns, by taking advantage of market opportunities, which affects the risk/return dichotomy; and personal risk, which concerns the risks that an executive faces as a result of adopting a pattern that favors strategic action.

The review of the literature on EO studies and risk-taking make it possible for one to list the elements that characterize risk-taking in organizations, as table 2 shows.

Based on the elements presented in table 2, the conceptual basis of risk-taking was established for this article, as discussed below.

2.2. Conceptual basis for the study of risk-taking in organizations

The review of the literature on risk-taking has made it possible to consolidate a conceptual basis for the study of this issue in relation to organizations. This basis is comprised of the elements of risk-taking, organized into four categories: general risk, decision-making risk, financial risk and business risk. This classification was designed by the authors of this article, in order to group the relevant elements by affinity and, as a

Table 2

Elements of Risk-Taking and Essential Authors

Elements that Characterize Risk-Taking	Authors
<ul style="list-style-type: none"> • Operations that are generally seen as involving high risks. • Having a non-conservative view when taking major decisions. 	Venkatraman (1989)
<ul style="list-style-type: none"> • Strong inclination towards high-risk projects (with the possibility of major returns). • Because of the nature of a bold environment, a broad variety of actions have to be taken to reach the organization's objectives. 	Miller and Friesen (1982) Covin and Slevin (1989)
<ul style="list-style-type: none"> • Tendency to undertake risky projects. • Management preference for acting daringly to achieve the organization's objectives. 	Miller (1983)
<ul style="list-style-type: none"> • Maintaining a bold, aggressive posture to maximize the probability of exploiting potential opportunities. 	Covin and Slevin (1989)
<ul style="list-style-type: none"> • Embracing formal business risks that involve venturing into the unknown with no awareness of the likelihood of success. • Taking financial risks that require that the organization obtain large loans in order to grow. • Taking personal risks, i.e., those that an executive takes by embracing behavior favoring a certain strategic action. • Embracing risk-taking behavior that involves major financial commitments to achieve high returns by grabbing opportunities. 	Lumpkin and Dess (1996) Dess and Lumpkin (2005)

result, establish their position in the organizational context more clearly. They also aimed to make empirical verification easier.

Table 3 presents the conceptual basis for the study of risk-taking in organizations, consolidated from the literature and adopted in this research study.

The identification of the elements presented in table 3 within an organization allows one to characterize its risk-taking behavior. In this study, this conceptual basis has been used in a more subjective and qualitative manner, in order to obtain evidence

about such behavior within in the organizations. Below, the method employed in the study is described.

3. RESEARCH METHOD

The nature of this research was exploratory and it resorted in particular to qualitative data (MASON, 1996). The study focused on those software companies in the state of Rio Grande do Sul (RS) that stand out for their entrepreneurship. The

Table 3

Conceptual Basis of Risk-Taking

Categories	Elements
General risk	<ul style="list-style-type: none"> • Organization characterized by a risk-taking behavior. • Operations generally characterized as high-risk ones. • Strong inclination to engage in high-risk projects.
Decision-making risk	<ul style="list-style-type: none"> • Non-conservative view when making decisions. • Strong, aggressive decision-making posture, to maximize the probability of exploiting potential opportunities. • Management preference for acting daringly in the pursuit of the organizational objectives. • Taking personal risk.
Financial risk	<ul style="list-style-type: none"> • Taking financial risks.
Business risk	<ul style="list-style-type: none"> • Taking business risks. • Undertaking major actions to reach the organization's objectives.

Source: Prepared by the authors based on the studies of Miller and Friesen (1982), Miller (1983), Covin and Slevin (1989), Venkatraman (1989), Lumpkin and Dess (1996), and Dess and Lumpkin (2005).

organizations seen as particularly enterprising in this study were those with an entrepreneurial orientation, as reflected in the presence of innovativeness, risk-taking, proactiveness, autonomy and competitive aggressiveness in these firms.

To identify organizations with this profile, the authors chose to conduct interviews with experts that head entities that represent the sector and who are truly familiar with the state's software organizations, being therefore qualified to indicate which of them stand out in terms of fulfilling the concept of having an entrepreneurial orientation. To this end, contact was established with the four entities that currently lead and articulate the actions of the software sector in Rio Grande do Sul: three sector entities, namely, *Associação das Empresas Brasileiras de Tecnologia da Informação – Regional RS* (Assespro-RS – Association of Brazilian IT Companies – Rio Grande do Sul Chapter), *Sindicato das Empresas de Informática do RS* (Sefprorgs – Union of IT Companies of Rio Grande do Sul) and *Associação Sul-rio-grandense de Apoio ao Desenvolvimento de Software* (Softsul – Rio Grande do Sul Association for the Support of Development), along with one broader entity that deals with a wide range of companies, *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (Sebrae-RS – Brazilian Support Service for Small Companies – Rio Grande do Sul Chapter). All of them maintain projects and activities designed to strengthen the sector by means of a software industry program. Contact with these four entities led to interviewing the heads of three of them (one per institution).

The interviewed experts have been active in the sector for more than 10 years and each of them maintains very close contact with approximately 200 organizations. All of them head their respective organizations and have wide-ranging knowledge about the sector organizations and activities. Given their substantial experience in the industry, the daily contact with the organizations and the fact that they head entities that lead the software sector's activities in the state, the authors felt that they would be the most qualified people to indicate the companies in Rio Grande do Sul that are outstandingly entrepreneurial. This is one of the main aspects justifying the choice of firms for this

study. Cooper and Schindler (2003) indicate that interviews with experts are suitable, within the universe of exploratory qualitative research, for obtaining information from influential or well-informed people about a given context.

The interviews with the experts resulted in a list of 18 software companies that stand out in their sector for their entrepreneurial orientation, as do their executives, though also taking into account their profile within the context of entrepreneurship. The 18 executives on the list were contacted, 13 of whom agreed to take part in the study. The authors then proceeded to collect data by means of in-depth interviews with the 13 executives (one per company), each of whom is also the chief executive of each of the 13 organizations. All but one are also shareholders in their firms.

The interviews with these executives took from 45 minutes to one and a half hours each and they were conducted in an open format, using a broad data-collection protocol that covered the five dimensions of an entrepreneurial orientation (innovativeness, risk-taking, proactiveness, autonomy and competitive aggressiveness). However, this article and its results only concern risk-taking. The collection of data on this subject was guided by the conceptual basis presented in table 3 (section 2.2), consisting of elements found in the specialized literature (MILLER and FRIESEN, 1982; MILLER, 1983; COVIN and SLEVIN, 1989; VENKATRAMAN, 1989; LUMPKIN and DESS, 1996; DESS and LUMPKIN, 2005), classified as general risk, decision-making risk, financial risk and business risk.

The data analysis was essentially qualitative. First, the recorded interviews were transcribed and this text was reviewed. Then, the authors tried to understand the data obtained, identifying the risk-taking elements and classifying them according to the conceptual basis employed in the study. This was followed by some of the stages of the model for non-structured interview analysis proposed by Mattos (2006): retrieving the moment of the interview, analyzing the pragmatic meaning of the conversation, assembling the consolidated verbal responses and analyzing sets. Table 4 summarizes the stages involved in the analysis of the interviews.

Table 4

Summary of the Stages of Data Analysis

Stages of Data Analysis

- Reading the transcribed interviews and listening to the audio recordings, to assimilate the contents of each.
- Reading each interview carefully and identifying the segments that explain aspects that reflect the risk-taking elements.
- Organizing the interviews according to the risk-taking elements.
- Consolidating the responses of the interviewees regarding each element.
- Reading the responses, now classified by risk-taking element, to analyze and understand the reality narrated by the interviewees, also trying to identify evidence of the theoretical elements in organizational practice, as well as to identify the outstanding situations that the interviewees pointed out.
- Rereading the classification of the risk-taking elements subsequently in order to confirm them.

Complementarily, the authors resorted to content analysis using a software program to analyze each interview and highlight the risk-taking aspects that came up most often in the interviews. This analytical stage consisted of reading the interviews and interpreting their content, to code the responses and create categories.

In the data analysis, the authors did not use any sophisticated quantification technique to achieve more highly specific validation. However, the researchers themselves reviewed the elements and the classifications that were made (KRIPPENDORFF, 1980), by reading and rereading the material at different points in time, with a gap in between, to allow them to confirm them.

The results presented in section 5 show that risk-taking was explicitly mentioned in the interviews with the 13 software organization executives. They highlight interview segments in order to consolidate a set of elements that characterize risk-taking, based on these data.

A brief contextualization of the software sector is provided below, along with the characterization of companies whose executives were interviewed. The results of the study are also presented.

4. SECTOR CONTEXT AND CHARACTERIZATION OF THE COMPANIES IN THE STUDY

The software industry is one of the outstanding sectors of the economy in terms of growth. According to data of the Ministry of Science and Technology, the sector has a direct impact on the production base of the entire economy and is a permanent source of production differentiation and innovation (NUNES, 2004). It also focuses on R&D, is related with the innovation of processes, products, and means of use, induces improvements in other chains of production and offers potential for the development of comparative advantages (CARVALHO JÚNIOR, 2005).

Brazilian industrial policy chose the software sector as an economic development priority, with growing domestic interest in software production (DESENVOLVIMENTO, 2006). Additionally, educational and research institutions and entities are interested in it in connection with the development of organizations and of entrepreneurship. These organizations ascribe to the sector a relevant role in the economic context, among other factors.

Rio Grande do Sul, according to information of the Rio Grande do Sul Area Development Agency (*Agência de Desenvolvimento Polo RS*), is expected to become the main center of IT in Brazil in just a few years. Along with the set of IT and industrial automation companies that already exist, the structure required for the sector's growth is emerging: technological development centers, enterprise incubators and the training of experts have become stronger thanks to the involvement of universities, governments, sector entities and the companies themselves (POLO RS, 2006).

The organizations whose executives were interviewed in this study are considered outstanding in their sector in terms of entrepreneurship, are growing and are consolidated in the market. They are headquartered in the metropolitan area of Rio Grande do Sul, some of them in technological complexes or incubators. Table 5 describes the 13 companies.

The results of the study are discussed below.

5. RISK-TAKING IN SOFTWARE COMPANIES: THE VOICE OF THEIR EXECUTIVES

To show how risk-taking is identified in the 13 organizations, this section has been broken down into the categories presented in section 2.2, table 3: general risk, decision-making risk, financial risk and business risk. During the course of the text, the authors will use segments of the interviews of the 13 executives to illustrate how the risk-taking elements are identified in the organizational practices. At the same time, the authors will identify outstanding situations, or those that merit inclusion in the conceptual basis of the study.

5.1. General risk

Broadly speaking, general risk refers to the organization's risk-taking behavior. To study this, three elements were taken into account: Organizations characterized by risk-taking behavior; Operations generally characterized as high risk^(*) ones; and A strong inclination toward high-risk projects.

The 13 interviewees made it clear that a risk-taking behavior is at play. One of them highlights that risk is inherent to entrepreneurial activity and to Brazilian reality: "Taking risks is in the DNA, it's in the blood of businessmen". The interviewed executives talk about the need to take risks to compete and to grow, especially in the software sector, which seems to be slightly more risk-oriented than more traditional sectors, due to ongoing technological progress. Thus, one should highlight that risk is inherent to the type of business, in a dynamic sector that undergoes many changes, which implies in operations that are generally considered risky, as the following segment from an interview illustrates:

- "[...] we deal with technology and I don't know if tomorrow my product's going to be a telex device. A multinational can invent a business suddenly and I may find myself unable to keep up, and then what am I to do? [...] when we used to work with analog technology and wanted to move to digital technology, which was a high investment, many business-

^(*) In this article, no dimension was ascribed to aspects such as high risk, major financial commitments, a large volume of resources, and major undertakings, as the responses are based on the perceptions of the interviewees.

Table 5

Characterization of the Companies whose Executives were Interviewed

Company	Interviewee	Number Employees	Size *	Units	Geographic Coverage	What the Company Does
Company 1	Superintendent (partner)	300	Medium	3	National	Produces software and provides IT services
Company 2	C.E.O. (partner)	100	Medium	9	International	Develops and markets telecom products
Company 3	C.E.O. (partner)	85	Small	2	National	Promotes IT services and solutions for companies
Company 4	Director-president (partner)	55	Small	2	National	Develops precision marketing applications
Company 5	Commercial director (partner)	10	Micro	3	National	Develops software for mobile computing
Company 6	Business manager	5.000	Large	100	International	Strategic IT consulting
Company 7	Director (partner)	26	Small	5	National	Advisory services and development of software for the healthcare area
Company 8	Director (partner)	34	Small	2	National	Develops websites and systems for the tourism area
Company 9	Director-president (partner)	250	Not informed	3	International	IT infrastructure services and solutions
Company 10	Director (partner)	350	Medium	26	National	Develops ERP for companies
Company 11	Director (partner)	100	Medium	7	National	Develops software for mechanical and electrical projects
Company 12	C.E.O. (partner)	200	Medium	11	International	Automation and systems integration solutions
Company 13	Director (partner)	96	Small	1	State	Develops digital solutions for the communication and IT areas

Observation: * Size based on annual income: micro company = up to R\$1,200,000.00; small = from R\$1,200,000.00 to R\$2,400,000.00; medium = from R\$2,400,000.00 to R\$48,000,000.00; large = above R\$48,000,000.00.

Source: Prepared by the authors (data from 2008).

people and friends said, ‘forget that, don’t go down this path, you’re going to come to grief’. But we invested heavily in technology and today, thanks to this investment, we’re alive” (Executive 2).

Emerging technology and the tendencies that the market and the major multinationals signal oblige firms to invest in order to keep up with technological changes. This implies investing in new things, often without knowing whether it is a good idea for the market to embrace the new technology. This means one is investing in the unknown (DESS and LUMPKIN, 2005), reflecting the risk vs. return dichotomy.

It is evident that the firms are operating in markets that are quite competitive, with the presence of major competitors,

which, sometimes, implies undertaking more major actions, with more risk.

- “What we bet on necessarily involves living with risk without changing our heartbeats. [...] for example: a bid in which you have IBM on one side, Oracle on the other, and us, and the three are competing; if the guy frightens easily, he’ll be scared to get on the plane and fly to São Paulo” (Executive 4).

The statements of some of the executives made it evident that there was an inclination toward risky projects at play, in situations, for instance, in which it was necessary to place one’s bet first, to reap the benefits later. Taking part in international trade fairs, investing in things that do not exist in the market yet,

carrying out major projects while finding it difficult to measure exactly the size and the return are among the examples. Some of the statements illustrate this reality:

- “[...] You’ve got to bet on things up front and then run with them. Going to an international trade fair, especially in Europe, means the cost is in euros [...] the marketing of the company, the presentation material, the portfolio, everything has to be international, in other languages, you have to work with translation [...] we decided to bet on this and were successful” (Executive 8).
- “[...] you’re always investing in things that don’t exist in the market yet, they’re future things, which may or may not work out” (Executive 2).

The interviewees also pointed out the risk of undertaking projects that involve competencies that the company lacks and that are under the responsibility of third parties:

- “We have a remote data transfer routine, then you involve a new technology in this, you develop an entire study based on this, and at the end of the day you’re affected by a problem that isn’t under your responsibility, that depends on telephone services, [...] so that solution of yours is no longer complete because of something you didn’t forecast [...]” (Executive 5).

The interviewees also give examples that outline specific projects that are considered risky. One of them concerns taking the company public. This has an impact on the company’s risk-related behavior: “With the entry of stockholders, the actions became more daring, the challenges became greater, we are now taking more risks”, one of the executives explains. Another example concerns setting up a unit abroad, where there are elements that the firm is not entirely familiar with due to legal, cultural, market and other differences, as the executive’s comment below describes.

- “[...] we’re going abroad, we’re going to Santiago. [...] no matter how much consulting and the like that you hire, a time will come when someone will say to you ‘ah, well, this happened, there’s a fine here’, something happens that you didn’t foresee. So this is a pure risk, in the pure sense of the word” (Executive 9).

The interviewees stressed their concern with taking calculated risks and with measuring the possibilities of success and of return on their investment better, which is essential for decision-making. Some of them pointed out a line of action based on sustainability, connected with a solid company, that is less vulnerable to certain economic circumstances and that takes risks in a planned and structured manner. Here are some illustrative comments.

- “[...] you have to do the right thing, put the cash where you get a return. I have experiences in which we end up making an investment and getting no return on it; that’s normal, but this can’t be constant, it must be an exception” (Executive 3).
- “[...] I try never to work just on one front; if I have a project, I usually work at least on two fronts, so if one doesn’t work out, the other can keep things afloat” (Executive 10).
- “[...] more and more, you have to make well grounded decisions. The issue ‘I’m going to buy such and such a company’ is, first, a feeling, it’s a good business deal; the second thing is calculating this out to see whether you aren’t buying a lemon” (Executive 11).
- “[...] now we consider risk analysis; theoretically it’s something that’s the opposite of risk-taking, but the fact that you have a sort of risk screening in the company, I think, gives you more freedom for people to propose ideas and take risks” (Executive 12).

They also point out the tough reality of the software sector, in particular of the very small and of the small companies, which are the majority in this industry. Some of these enterprises are highly vulnerable to risk because the entrepreneurs are ill prepared; they are generally technical professionals, with no formal business education, who start up their companies based on the development of technical solutions and products. No matter how good their products, they have difficulty with the commercial area, they do not know how to calculate costs properly, they operate with pricing that is lower than the market price, and they have management problems. Thus, they end up taking some unnecessary risks, due to lack of business management savvy, as the following statement illustrates:

- “[...] the guy left university and was pushed into this context [...] he falls into the hands of a businessperson with no culture of buying IT technology and that just really wants to exploit him [...] and then this guy turns into a poorly paid employee of that business. [...] We’re negotiating, for example, with firms whose debt level is equal to their annual invoicing, which is absurd for our sector [...]” (Executive 13).

To reduce this problem, there are sector entities in Rio Grande do Sul that are concerned with strengthening the software companies. Their activities include the Sebrae-RS project for the software sector. One of the main initiatives here is to foster strategic alliances, partnering agreements, and mergers and acquisitions among the companies, to move these entrepreneurs out of the danger zone.

Using the conceptual basis for risk-taking as a starting point, one can state that all the elements of the general risk category were explicitly referred to in the interviews conducted with

the executives. Therefore, these elements are identified in the organizations. A broad risk-taking behavior is evident. The executives associate the act of being enterprising with risk, saying that it is impossible to operate in the market without risk-taking, in particular in the software sector, which is dynamic and undergoes constant technological changes. Their concern with calculated risks also stands out, a fact that should be considered in the conceptual basis of risk-taking, due to the importance that the interviewees ascribe to this aspect. Thus, the inclusion of a new element in the conceptual basis, called **calculated risk taking**, is suggested.

Though the literature on risk taking and on entrepreneurial orientation that was consulted for this study does not deal with calculated risk, Sebrae includes it as one of the characteristics of enterprising behavior covered in its Empretec program, developed based on a study of the United Nations (UN). This further strengthens the importance of adding it to the conceptual basis of this study.

Risk-taking based on planned decisions, with calculated risks, reflects the presence of a decision-making criterion (VENKATRAMAN, 1989). Below, decision-making risk is addressed.

5.2. Decision-making risk

Decision-making risk is the risk taken by senior management in the face of decisions. To study it, four elements were taken into account: Adopting a non-conservative view in decision-making; A strong and aggressive decision-making posture, to maximize the likelihood of taking advantage of potential opportunities; Management preference for acting with daring in order to achieve the organizational objectives; and Taking personal risks.

The interviewees voiced different positions in relation to this. Some have a bolder attitude, considering their style of action and needs in the operating context: “[...] I know that there’s a steam roller right behind me, so I can’t stand around doing nothing”, states one executive. Some talk about having to be more aggressive when it comes to making decisions in order to earn greater returns.

- “[...] it’s useless being too conservative or too bold. You have to stay in between. [...] We always try to evaluate all the variables” (Executive 1).
- “The market we’re in is a market that’s becoming consolidated; the market’s very competitive. If you aren’t bold, you won’t close business deals; there’ll be a competitor of yours that will offer special terms” (Executive 6).

There are other that act more gradually, taking care not to “go overboard, so you don’t risk the assets you’ve already amassed”, as one interviewee states. Their positioning favors a

balance, with occasions when it is important to be bolder, and others when it is prudent to be more conservative.

- “[...] we’re not afraid of taking risks, but if I’m joining a war, it’s to win it; if I go there and see that I’ll lose, I won’t join it” (Executive 10).
- “The company is very down to earth and financially healthy, because we don’t go into a line of business to lose money. When we talk about boldness, I mean we’re daring, but always with the backing of planning, with organization; it’s not about going out shooting in the dark” (Executive 6).

Decision-making risk seems to have a direct relation with the personal behavior of the head of the firm or of the management group that runs the enterprise. This leads to a decision-making criterion or pattern within the organization (VENKATRAMAN, 1989). This can also be due to an organizational culture that encourages a certain line of action.

- “[...] I think that is pretty much part of the culture, it’s in the blood of the people who work here” (Executive 6).
- “[...] At present, we’re about 80 people who undertake major challenges for the company. These people are always connected with projects for major clients, with major responsibilities, and they face countless problems, situations that involve analyzing risk” (Executive 3).
- “[...] Here the balance among the partners is good; we have directors that are more down to earth and others that are bolder. [...] I myself am more of a risk-oriented guy and I like having people who can provide a balance. When I get together with a guy that I can see is even wilder than I am, I take on the role of holding him back, and when I see that I’m with a guy that is too sedate, then I push forward” (Executive 12).

The change in this pattern of behavior concerning decision-making stands out when new people or investors join the firm, or when there is a culture change in the organization, which can result from company mergers and acquisitions.

The interviewees describe decision-making situations that indicate exploring potential opportunities. This is more common in companies that have major competitors. The statements below exemplify postures that are more aggressive.

- “[...] the fact that you don’t fear taking risks, and principally not missing opportunities, made a lot of difference for our growth” (Executive 8).
- “[...] the 2003 merger gave us a different potential; we started being much more strongly acknowledged in the market. [...] It was an important step for us” (Executive 3).

- “[...] we want to compete with benchmark companies, with the best; we don’t want to sell any service at any price. So we established a starting level, facing even IBM and SAP; we think we are quite pugnacious in this regard” (Executive 4).

Though this element is also linked to the risks taken by the decision-makers (DESS and LUMPKIN, 2005), two aspects complement it: responsibility for taking the risk, not only among the management, but also among the other people in the organization; and the absence of a risk-taking profile, which results in an inertial behavior, in being non-enterprising and lacking commitment.

Using the conceptual basis on risk-taking as a starting point, one can say that all the elements of the decision-making risk category came out explicitly in the interviews with the executives and therefore, that they are identified in the organizations. One factor that stands out is the relation between risk and the profile of the decision-maker, which suggests that if there is a desire to take further risks, then there is a need to put people with a bolder profile in management positions or to encourage this behavior. Below, risk taking is discussed in terms of its financial aspects.

5.3. Financial risk

Financial risk was studied from the standpoint of a Financial risk-taking posture, based on the opinions of the executives. Unlike general risk and decision-making risk, most of the interviewees regarded financial risk as something to be avoided. Their statements indicate a posture that is shy of taking financial risk.

- “[...] I take technical risks, fiscal risks, business risks; now, we don’t take risks that concern financial matters [...] the company has never had a cash problem, because it has a conservative posture in this sense” (Executive 1).
- “[...] over these 12 years we’ve never run at a loss; we’ve never had to take out a loan in the market to have working capital, so there’s a line of action that is strongly based on sustainability. This doesn’t mean not running risks, but indicates a vision of having a sound company; perhaps we might be at a higher growth level, but far more vulnerable to certain economic circumstances” (Executive 3).
- “[...] we’re allergic to financial risk. It’s been more than 10 years or so since we last discounted a trade note. We’re conservative from the financial standpoint [...]” (Executive 11).

The interviewees that admit to taking greater financial risks do so because they need to invest heavily in new technologies, a prerequisite for continuing to be a player in the market, but that carries risks, in that a new technology may or may not be

successful. In such cases, the financial risk is inevitable and it is hard to evaluate the return (DESS and LUMPKIN, 2005).

- “[...] we were working with analog technology and wanted to move to digital technology; we invested heavily in this and today, thanks to this investment, we’re alive. [...] we’ve made mistakes regarding some projects; operators told us ‘invest in this product because it’s fantastic’ and we did and then we went back and heard ‘oh, but I don’t want this any longer,’ so you put it all in the waste bin. What is relevant is the sum of it all and we’re going to continue doing this, these are risks” (Executive 2).

Another situation concerns a more specific case: a company that hired consulting services in order to get investors and to implement investment projects. By hiring a specialized enterprise, the risk components of this process, which would be risky otherwise, are properly assessed.

- “[...] we wanted to get shareholders with know-how, to invest in the company, and who could see its potential. [...] we hired a firm; they took us to the Venture Forum and, in 2003, they conducted the company’s entire transformation process” (Executive 7).

Using the conceptual basis of risk-taking as a starting point, one can say that the element of the financial risk category was explicitly stated in the interviews. Therefore, it is identified in the organizations. However, caution regarding financial risk is evident and there is even a certain degree of aversion to it among some of the executives. As for business risk, it is seen in a different light, as the next section shows.

5.4. Business risk

Business risk was studied by taking into account the Posture of taking business risk and the Need to take major actions to achieve the organizational objectives. This risk is accepted by most executives, as one can see in the interviewees’ statements below.

- “[...] we have quite an aggressive profile in this respect. [...] sometimes we get things right, and sometimes we don’t; we try to learn from our mistakes and we get things right more often than not” (Executive 8).
- “[...] we’ve never had a great deal of regard for [the size of the adversary, the market’s level of requirements. [...] we’ve won bids that involved the top players in the world” (Executive 4).

Some executives mention the need to be aggressive and to undertake major actions, given the market in which they compete, the company’s stage, and the rapid pace of technological change, among other factors.

- “[...] we felt that to take this growth leap, we’d have to consolidate other companies, whether through mergers or incorporation, to make the company stronger and to be able to offer services to large enterprises” (Executive 3).
- “[...] our company has always had antibodies, it always fights the competition, [...] it’s aggressive; it’s terribly competitive nowadays. Ask Siemens, our competitor in Brazil. They have tried to buy us out twice” (Executive 12).

Once again, the statements refer to competitors and to competing with major enterprises and with multinationals. The situation in which these companies aim for fast expansion is identical; this is often feasible through an association between companies.

- “[...] a while back I was at an event where one of the speakers said: ‘Today, the positioning of IT companies is one of two things: either it’s a predator or it’s a bride.’ [...] our company positioned itself very well at that point in time; today, one sees the result of this and the companies have to follow this path. If they don’t, as the market is becoming narrower, companies that used to deal only with major accounts are now creating a small business area, [...] and those that took the small firms are moving down. At some point, there won’t be a market anymore and they’ll have to sell their companies to other, bigger enterprises” (Executive 7).
- “[...] when you buy a company in the software market, what you’re buying are the people and the software. [...] IT acquisitions are not that simple, but it’s something we’ve been doing, with great parsimony and taking a lot of care, because, as we’ve been growing 30% a year, this is part of the process [...]” (Executive 9).

Expansion projects stand out in this context. One executive describes the structuring of franchises conducted in 2007, which required a major investment; some initiatives were monitored, especially outside Brazil. Additionally, company acquisitions were also described. These were undertaken to achieve fast expansion. The interviewees also mentioned opening branch offices in new markets and internationalization, a rising trend within this sector (ROSELINO and DIEGUES, 2006).

- “[...] we undertook the risk that goes with developing partnering agreements, opening the market, traveling, crossing new frontiers, opening a branch in a totally different market [...]” (Executive 10).
- “[...] we started here in [the city of] Porto Alegre, then we opened an office in São Paulo, in 2004. In 2005, the opportunity to pursue international business arose; here you face the issue of taking a risk, with innovation itself. [...] we met with good receptiveness abroad” (Executive 8).

There are also cases in which there is a wish for taking more risks by means of new initiatives, but there is a fear that they may be unsuccessful.

- “[...] the segments that we already have, we can’t let go. [...] I’ve been thinking for quite some time, ‘oh, let’s change, the sales force area is saturated.’ [...] but it would be necessary to conduct a huge study, to check needs and everything else [...]. So it’s much easier for me to sell a product to a company such as Nutrella if I already have Sevenboys [...]” (Executive 5).

Overall, the statements of the executives reveal that most of them have a business risk acceptance posture. These risks are referred to in connection with opening new markets, entering untested markets (DESS and LUMPKIN, 2005), expanding by opening branches, and establishing an association with other enterprises, among others. They also mention the “battle of giants”, reflecting a daring posture in relation to the competition. Based on the conceptual basis of risk-taking, one can say that the elements of the business risk category were explicitly mentioned in the interviews and that they therefore have an impact upon the organizations. The consolidation of the set of elements that characterize risk-taking follows, below.

5.5. Risk-taking in organizations and consolidating a set of elements

The study with the 13 executives made it possible to identify that the elements of the conceptual basis of risk-taking affect organizations, a fact that the statements of the interviewees illustrate.

To corroborate the presence of these elements and to provide indications about their occurrence in the interviews, a review of the said interviews was conducted using a content analysis software program. This enabled highlighting the risk-taking elements found in the statements of the executives and their presence in each interview. Table 6 shows the results of this analysis, also listing the highlighted aspects with the respective risk-taking category to which each one of them refers.

Based on table 6, one can see that the presence in the organizations of the elements of risk-taking of the general risk category is corroborated by five aspects found in the interviews, in particular taking calculated risks and the need to take risks to survive and grow. This need to take risks is connected with the fact that the sector is a highly dynamic one and with the constant technology changes, which dictate that companies move and invest in innovations and in new technologies. As for the concern with calculated risks, this might be the result of the stage at which the organizations find themselves, as they are all consolidated in the market and largely professionalized. According to two of the interviewed executives, at the time of the start-ups of their companies, the risks taken (non-calculated ones) were far greater than those that the firm takes today, a common situation among

Table 6

Most Often Mentioned Risk-Taking Elements in the Interviews

Risk-Taking Elements Extracted From the Interviews	Number of Executives That Mentioned Them [n=13]	Risk-Taking Category to Which They Refer
• Calculated risk-taking	11	General risk
• Need to take risks to survive and to grow	10	General risk
• Boldness in business decision-making	10	Business risk
• Decision-making boldness in general	8	Decision-making risk
• Personal risk-taking	7	Decision-making risk
• Boldness in making financial decisions	7	Financial risk
• Risk-taking is inherent to the sector	6	General risk
• Evaluation of the variables involved in making the decision	5	General risk
• Sustainable growth with no funds from third parties	5	Financial risk
• Risk-taking with no certainty of obtaining returns	5	General risk
• Conservative financial decisions	4	Financial risk
• Operating in a highly competitive market	4	Business risk

very small and small enterprises in this industry, as they go into business with a deficient management structure.

In the category of decision-making risks, what stands out is the strong relation with the behavior of the decision-maker. These interviews show that there is a bold commitment regarding decisions in general and that there is personal risk-taking among the heads of these businesses. However, there is also a certain balance: at some points in time, the decisions are more daring and, at others, more conservative, which, in a way, is connected with taking calculated risks. Some enterprises, for instance, have a management board that is comprised of a mixture of bolder and of more conservative people, which affects the organization's posture (WIKLUND and SHEPHERD, 2005).

As for the financial risk category, it is evident that there is a certain aversion to this type of risk, according to four interviewees, who regard the pursuit of external funding, in particular, as financial risk. However, it was evident that there is growth-oriented investment, described by five interviewees as sustainable growth. Boldness in financial decision-making, a fact identified by seven interviewees (and explicitly stated by some), results from the investments that are required for growth, such as setting up new units, structuring franchises, expanding abroad, and investing in new technologies to keep up with the sector's rapid changes. These decisions and projects imply a financial risk and point to a risk vs. return dichotomy (DESS and LUMPKIN, 2005). However, most of the interviewees, when questioned, state that they do not take financial risks.

Regarding the business risk category, what stands out is a daring behavior in business decisions, a fact reflected in 10 of the interviews. The executives clearly take the risks implied

in market actions and business decisions. Sometimes, this is driven by operating in highly competitive markets, as explained by four executives, who compete with major players. In these cases, the executives indicate that bold actions are required to achieve the organizational objectives. The expansion movements stand out in the statements voiced regarding acquisitions, mergers, opening of new units, internationalization and joint activities, all of which outline the sector trends (ROSELINO and DIEGUES, 2006).

Table 7, below, shows a set of elements that characterizes risk-taking, consolidated on the basis of the theory and the 13 interviews that were conducted: the elements in normal letters were mentioned more often by the interviewees; those in italics were mentioned less often, while those in bold are being proposed as additional elements of the EO conceptual basis.

Table 7 leads to the conclusion that the general risk category seems to be the most developed one within the organizations. In the set of elements, several were mentioned less often, which suggests that some are better developed than others are within the software companies. The elements mentioned less often possibly deserve more attention in the researched firms.

Below, the authors' final thoughts regarding this study.

6. FINAL THOUGHTS: RISK-TAKING IN SOFTWARE COMPANIES

Given the importance of an entrepreneurial orientation to the context of the management of organizations and as risk-taking is one of the most typical dimensions of enterprising practices (MELLO and LEÃO, 2005), this study aimed to consolidate a set

Table 7

Risk-Taking Elements – Consolidated Based on the Theory and on the 13 Interviews Conducted

Category	Risk-Taking Elements
General risk	<ul style="list-style-type: none"> • Organization characterized by risk-taking behavior. Operations generally characterized as being high-risk ones. • Strong tendency to engage in high-risk projects. • Calculated risk-taking posture.
Decision-making risk	<ul style="list-style-type: none"> • <i>Non-conservative view adopted in decision-making.</i> • Strong and aggressive decision-making posture, to maximize the likelihood of exploiting potential opportunities. • Management preference for acting boldly to achieve organizational objectives. • <i>Taking personal risks.</i>
Financial risk	<ul style="list-style-type: none"> • Financial risk-taking posture.
Business risk	<ul style="list-style-type: none"> • Business risk-taking posture. • <i>Major actions have to be undertaken to achieve the organizational objectives.</i>

Legend: Normal letters = elements mentioned more often by the interviewees; Italic letters = elements mentioned less often by the interviewees; Bold letters = new element.

of elements that characterizes risk-taking in software companies based on the literature and on organizational practices.

In the software sector, a substantial part of the risk is inherent to the field of activity itself. The companies have to innovate and to be prepared to take risks. Several risk-taking practices were identified in the interviews with the executives and they are summarized in table 8, which illustrates the main actions that point to risk-taking in the companies that took part in this study.

The actions presented in table 8 depict the reality of the studied companies, though they contain elements that apply to organizations in the software industry.

The results of the study show that the companies are characterized by risk-taking behavior, but in different ways. General risk is the result of the fast pace of the sector, with its constant technological changes, examples of high-risk projects

and operations having been identified. Decision-making risk is evident; the management seems to prefer to take bold action regarding decisions, though always seeking a balance between boldness and conservatism. As for financial risk, it was the type that stood out the least in the interviews, as the interviewed executives have a certain measure of aversion to it, especially in relation to obtaining outside funding. Business risk, on the contrary, stands out, due to competing with major enterprises and with multinationals, also involving major actions, such as mergers and acquisitions. Additionally, there is a posture of taking calculated risks, which is proposed as a new element.

The interviews with the executives made it possible to survey actual risk-taking practices in the 13 organizations, as well as the executives' opinions of this issue; they reflect the elements of the conceptual basis of risk-taking used in this study, enabling their consolidation.

Table 8

Mains Actions that Indicate Risk-Taking in the Researched Companies

Mains Actions that Indicate Risk-Taking
<ul style="list-style-type: none"> • Investing in innovations, technological trends and emerging technologies not yet consolidated, due to the risk of failing to survive without these initiatives, but running the risk that these technologies might fail to become consolidated in the market. • Corporate consolidations (mergers, acquisitions, alliances, etc.), to gain strength in order to compete with major competitors and multinationals. • Going public, an action that, according to the study, heightens risk-taking, whether as a result of this measure itself, whether by the continuity of the company, which starts facing bolder risks. • Internationalization, considered by the interviewees an important element of expansion, albeit one that involves risks, as not all aspects of it can be measured. • Executives' bold decision-making behavior.

Based on the literature and, above all, on the actual risk-taking practices of the organizations, a set of elements and of aggregating categories was consolidated. This characterizes risk-taking in the researched companies. This set of elements makes it possible to conduct activities that target the development of risk-taking in these firms, and it can provide indications for software sector companies. Thus, this article contributes to the debate on entrepreneurship at the organizational level and on the elements connected with the development of risk-taking in software companies.

Therefore, this study provides a contribution to organizational management practices, to the extent that it proposes a frame of reference that can aid the understanding of risk-taking, and that can be used by executives, businesspeople and software company managers as a guide for those that aim to develop this type of behavior in their organizations.

Furthermore, in the course of section 5, several examples of effective practices, collected in the interviews, were presented. These show the different experiences and learnings of the executives of the software companies and might be useful as a source of knowledge and experience for companies in this industry.

In academic terms, the study for the consolidation of the set of elements that comprise risk-taking confirmed, in management practice, what the theory had already indicated about the elements of risk-taking. This research study also adds to knowledge production, as categories are proposed that add a new element to the conceptual basis, consolidated in a set of elements that enrich theory with practice. Following this study, the authors plan to study the understanding of the other EO dimensions within the context of software companies, and to do so in greater depth, thus enabling the consolidation of a set of EO elements with the five dimensions. ♦

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ABSTRACT

Risk-taking in software companies: A sector case study in Rio Grande do Sul

This article approaches risk-taking as one of the dimensions of an entrepreneurial orientation (EO) in an organization. The research aims to consolidate a set of components that characterize risk-taking in software companies, based on the literature and on organizational practice. The review of the theory resumes the concepts of risk-taking and EO, defined as the organization's inclination to undertake risky projects and the preference of managers to take bold action in order to achieve the organizational goals. The research method employed was exploratory and qualitative, with data collection through in-depth interviews conducted with executives from 13 notably entrepreneurial software organizations in the state of Rio Grande do Sul, Brazil. The results indicate that the companies are characterized by risk-taking behavior, even though this manifests itself in different ways. The overall risk is evident because of the sector's dynamism, with constantly changing technologies. The business risk is the one that stands out the most, due to competition with large companies and multinationals. The decision-making risk tends toward a balance, with some decisions that are daring and others that are more conservative. The financial risk is expressed with a measure of distaste. The article ends with the consolidation of a set of elements that characterize risk-taking in the researched organizations, in which calculated risk stands out as a new element.

Keywords: risk-taking, entrepreneurial orientation, software companies.

RESUMEN

La asunción de riesgos en empresas de software: un estudio del sector en el estado de Rio Grande do Sul

En este artículo se estudia la asunción de riesgos como una de las dimensiones de la orientación emprendedora (OE) de una organización. Se tiene como objetivo consolidar un conjunto de elementos que caracterizan la asunción de riesgos en empresas de *software*, a partir de los textos teóricos y de la práctica organizacional. En la revisión teórica se discuten la OE y la asunción de riesgos como una tendencia de la organización a comprometerse con proyectos de riesgo y la preferencia de los administradores por actuar con osadía para alcanzar los objetivos de la empresa. El método de investigación utilizado es de carácter exploratorio y cualitativo, con recolección de datos por medio de entrevistas en profundidad que se hicieron a ejecutivos de 13 empresas de *software* del estado de Rio Grande do Sul, consideradas emprendedoras. Los resultados del estudio demuestran que las empresas se caracterizan por un comportamiento de asumir riesgos, aunque este comportamiento repercute de distintas formas. El riesgo general es evidente debido a la dinámica del sector, con constantes cambios tecnológicos. El riesgo en negocios se destaca como el más evidenciado, en razón de la competencia con grandes empresas y multinacionales. El riesgo en la decisión tiende a un equilibrio, con decisiones más osadas y otras más conservadoras. Se manifiesta el riesgo financiero con cierta aversión. Se concluye con la consolidación de un conjunto de elementos que caracterizan la asunción de riesgos en las organizaciones investigadas, en que se destaca el riesgo calculado como un nuevo elemento.

Palabras clave: asunción de riesgos, orientación emprendedora, empresas de *software*.